Space Weather Forecast

Issued on Friday, 16 June 2023 at 13:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate solar activity with R1/R2 Radio Blackouts. Further G1/Minor geomagnetic storm conditions likely today, slowly easing.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Moderate with the the two largest flares peaking at 16/0530 and 1038 UTC. There are currently nine sunspot regions on the visible disc. The two largest regions on the disc are in the southeast quadrant, but neither are significantly complex. However, one of them is close to another group which has produced a high level Common-class flare. The close proximity of these two groups could enhance magnetic shear across the two regions. Near the northeast limb, a new region has started to reveal penumbra on its trailing spot and again this is in close proximity to a further simple region so these two regions are also interacting magnetically. The two largest flares of the last 24 hours have originated from these regions. The remaining regions currently appear small, weak and simple. Coronal Mass Ejections (CMEs) have been observed using available imagery.
Solar Wind / Geomagnetic Activity: The solar wind showed the onset of a strong coronal hole fast wind. Wind speeds started the period at slow levels, steadily increasing from around 16/1400 UTC to reach strong levels, currently varying between 630-740 km/s. The total magnetic field was moderate to strong at first, but dropped back to weak levels around 16/0300 UTC. The north-south component was moderately southward directed at times until around 16/0300 UTC when it became mostly weakly southward directed. Geomagnetic activity was Quiet at first, soon becoming Active to G1/Minor Storm (Kp 4-5), with a G2/Moderate Storm interval 16/0300-0600 UTC.
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is expected to be Low to Moderate, with a chance of further Moderate-class flares. Further Moderate-class flares could occur from the regions near the northeast limb, but also from the larger regions in the southeast.
Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs currently expected. Earth is currently under the influence of a coronal hole fast wind, which is followed by a second coronal hole. The influence of their fast wind is likely to persist for much of this forecast period, although likely gradually declining in strength and activity. Initially strong solar wind speeds should gradually decrease to elevated levels through Day 2 (17 June), and perhaps to slightly elevated levels during Days 3 and 4 (18-19 June). Geomagnetic activity is forecast to be Active to G1/Minor Storm (Kp 5) at first, gradually decreasing to become Unsettled to Active (Kp 3-4) through tomorrow. Geomagnetic activity is expected to further decline thereafter, likely becoming Quiet to Unsettled (Kp 1-3) during Days 3 and 4.
Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is forecast to persist at background levels with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	70	30	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	3	3	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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